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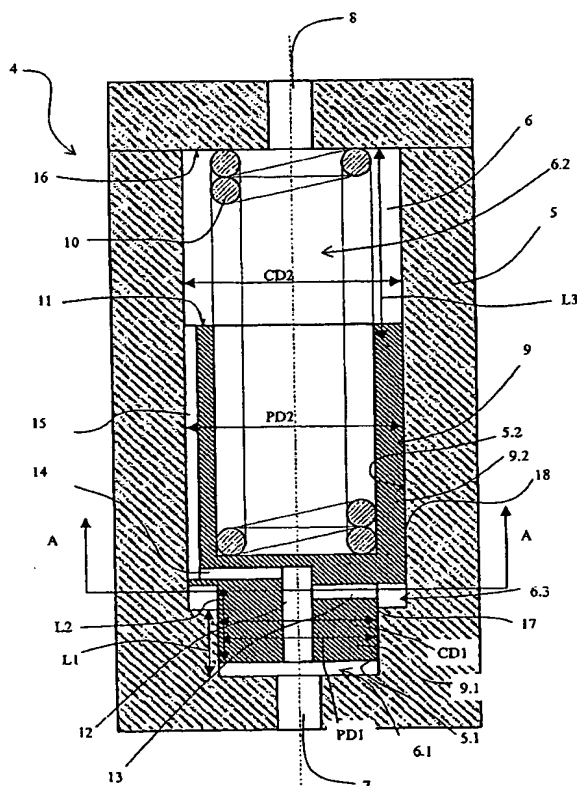
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| <p>(51) <b>International Patent Classification<sup>7</sup>:</b> <b>F02M 55/02</b>,<br/>59/46, 63/02</p> <p>(21) <b>International Application Number:</b><br/>PCT/FI2004/000006</p> <p>(22) <b>International Filing Date:</b> 9 January 2004 (09.01.2004)</p> <p>(25) <b>Filing Language:</b> English</p> <p>(26) <b>Publication Language:</b> English</p> <p>(30) <b>Priority Data:</b><br/>20030054 15 January 2003 (15.01.2003) FI</p> <p>(71) <b>Applicant (for all designated States except US):</b> WÄRT-<br/>SILÄ FINLAND OY [FIFI]; Tarhaajantie 2, FIN-65380<br/>Vaasa (FI).</p> <p>(72) <b>Inventor; and</b></p> <p>(75) <b>Inventor/Applicant (for US only):</b> LEHTONEN, Kai<br/>[FI/FI]; Gerbyn rantatie 9 A 3, FIN-65280 Vaasa (FI).</p> | <p>(74) <b>Agent:</b> AWEK INDUSTRIAL PATENTS LTD OY; P.O.<br/>Box 230, Lautatarhankatu 6, FIN-00101 Helsinki (FI).</p> <p>(81) <b>Designated States (unless otherwise indicated, for every<br/>kind of national protection available):</b> AE, AG, AL, AM,<br/>AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,<br/>CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,<br/>GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,<br/>KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,<br/>MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,<br/>PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,<br/>TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,<br/>ZW.</p> <p>(84) <b>Designated States (unless otherwise indicated, for every<br/>kind of regional protection available):</b> ARIPO (BW, GH,<br/>GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),<br/>Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-<br/>pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,<br/>GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,</p> |
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*[Continued on next page]*

(54) Title: ARRANGEMENT IN FUEL INJECTION APPARATUS



**(57) Abstract:** Arrangement in a fuel injection system for controlling the fuel injection, the arrangement (4) comprising a body part (5) having a space (6), through which the fuel to be injected during operation flows, and a fuel inlet opening (7) and an outlet opening (8) opening into the space, the arrangement (4) further comprising a piston means (9) arranged movably inside the space, the piston means having a channel or the like (12, 14, 15) arranged therein for creating a flow connection between the fuel inlet opening (7) and the outlet opening (8), whereby in the arrangement the piston means (9) can divide the space (6) into a first part (6.1) connected with the inlet opening (7) and a second part (6.2) connected with the outlet opening (8), the arrangement further comprising a spring or the like (10) for creating a force acting on the piston means (9) in a direction opposite to that of the main fuel flow. In the arrangement the piston means (9) and the body part (5) are formed so that when the piston means is in the end adjacent the fuel inlet opening (7) they delimit at least one third space (6.3), the volume of which depends on the mutual positions of the piston means (9) and the body part (5).

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 2004/000006

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: F02M 55/02, F02M 59/46, F02M 63/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: F02M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	DE 10254465 A1 (DENSO CORP.), 26 June 2003 (26.06.2003), figures 1-7, abstract --	
A	DE 19640085 C1 (L'ORANGE GMBH), 2 April 1998 (02.04.1998), figures 1-5, abstract --	
A	DE 19621021 A1 (DAIMLER-BENZ AKTIENGESSELLSCHAFT), 2 October 1997 (02.10.1997), figures 1-7, abstract --	
A	DE 19747092 A1 (SIEMENS AG), 29 April 1999 (29.04.1999), figures 1-9, abstract --	

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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"&amp;" document member of the same patent family

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 5692476 A (EGLER ET AL), 2 December 1997 (02.12.1997), figures 1-3, abstract --	
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Information on patent family members

27/02/2004

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